

Books

Microwave Measurements. By Edward L. Ginzton. 515 pp. McGraw-Hill Book Co., Inc., New York, 1957. \$12.00. *Reviewed by R. W. Hellwarth, Hughes Research Laboratories.*

Those who find themselves concerned for the first time with microwave experimentation and practice will welcome the appearance of *Microwave Measurements*. In this book the author has distilled from the mass of existing detailed literature a coherent, very readable account of methods which are fundamental to all microwave techniques. A description of the most common means of generating, controlling, detecting, and measuring microwave power in the laboratory occupies the first half of the book. The accompanying theoretical analyses of such components as klystrons, traveling wave tubes, triodes (magnetrons are omitted), stabilizing circuits, crystal rectifiers, barreters, etc., are designed to equip the reader with sufficient understanding to select appropriate elements for a given application and to use them without risking difficulties. Typical characteristics of the various elements are given along with helpful qualitative comparisons of reliability, ruggedness, reproducibility, and ranges of applicability.

The second half of the book deals with the measurement of frequency and impedance and the interpretations of these measurements in terms of the parameters which describe cavities, attenuators, and other simple waveguide structures. This section is prefaced by a theoretical digression on the generalized impedance concept and transmission line analysis which serves well as either an initial text or review of the subjects. Introductions to some of the more powerful methods and theorems of circuits analysis are also incorporated into the main discussion of standard measurement techniques. Copious footnotes supply many proofs and details, and provide an excellent introduction to the literature.

Those who are already familiar with the now classic works on microwave techniques in the MIT Radiation Lab series and elsewhere will probably not consider the present volume to be of added interest. Many special subjects such as transmitters and receivers, communication, antennas, propagation, and microwave interactions with matter have been purposefully omitted in deference to the more complete development of material considered to be fundamental. However, *Microwave Measurements* has distinct value to the graduate

student who will find it the most clear and up-to-date initiation to the subject, to the more than casual experimenter who has become concerned with microwaves, and to the teacher who will appreciate the obvious teaching experience that has gone into the writing of the book.

Advances in Electronics and Electron Physics, Vol. 9. Edited by L. Marton. 347 pp. Academic Press Inc., New York, 1957. \$9.00. *Reviewed by George H. Weiss, University of Maryland.*

According to its preface, Volume 9 of *Advances in Electronics and Electron Physics* represents an experiment in this series. The experiment consists in grouping the contents of the volume around a central theme; in this instance, geophysics.

The theme is an admirable and a timely one during the current International Geophysical Year. Geophysical experiments have provided many of the as yet unresolved problems in meson physics and cosmic-ray theory. There have recently been many exciting advances in radio transmission techniques such as the use of back-scatter and meteor-burst communication which have opened new fields for investigation both in modern physics and classical theory. The current volume contains seven articles which summarize some of the work in overlapping investigations of geophysical and electronic subjects. The articles and their authors are: Aurora Borealis, C. T. Elvey; Negative Ions, L. M. Branscomb; Radio Observations of Meteors, J. G. Davies; Intensity Variations in Cosmic Rays, D. C. Rose; Radio-Wave Propagation—A Review, R. L. Smith-Rose; Electronics in Oceanography, J. B. Hersey; Contributions of Electronics to Seismology and Geomagnetism, B. S. Melton.

The technical level of the articles is such that they can be read by a physicist without a too detailed knowledge of geophysics. Most of the papers deal with experimental work. Perhaps one or two theoretical papers would have increased the value of this collection. The papers are uniformly well written and one can only find minor fault with any of them. For example, the paper by Branscomb might have contained a more detailed account of the relation of his topic to actual transmission problems. The paper by Melton contains a bit too much of engineering detail for a physics volume. Otherwise the experiment is certainly a success, and the volume is an informative and useful introduction to adjoining fields in electron physics and geophysics.

Introduction to the Mechanics of Stellar Systems. By Rudolph Kurth. Translated by F. D. Kahn. 174 pp. Pergamon Press, London and New York, 1957. \$9.00. *Reviewed by C. C. Kiess, National Bureau of Standards.*

This book is not easy reading, for, as its author states, it "is intended to serve as an introduction for more advanced students". For them many problems and refer-